Dell Inc.

PowerEdge R905 (AMD Opteron 8354, 2.20 GHz)

<table>
<thead>
<tr>
<th>Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench</td>
</tr>
<tr>
<td>401.bzip2</td>
</tr>
<tr>
<td>403.gcc</td>
</tr>
<tr>
<td>429.mcf</td>
</tr>
<tr>
<td>445.gobmk</td>
</tr>
<tr>
<td>456.hmmer</td>
</tr>
<tr>
<td>458.sjeng</td>
</tr>
<tr>
<td>462.libquantum</td>
</tr>
<tr>
<td>471.omnetpp</td>
</tr>
<tr>
<td>473.astar</td>
</tr>
<tr>
<td>483.xalancbmk</td>
</tr>
</tbody>
</table>

SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated. The bug is fixed in CPU2006 V1.1.
SPEC CINT2006 Result

Dell Inc. PowerEdge R905 (AMD Opteron 8354, 2.20 GHz)

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>NC</td>
</tr>
</tbody>
</table>

CPU2006 license: 55  Test date: Mar-2008
Test sponsor: Dell Inc.  Hardware Availability: Apr-2008
Tested by: Dell Inc.  Software Availability: May-2008

SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.

### Hardware

| CPU Name: | AMD Opteron 8354 |
| CPU Characteristics: | 
| CPU MHz: | 2200 |
| FPU: | Integrated |
| CPU(s) enabled: | 16 cores, 4 chips, 4 cores/chip |
| CPU(s) orderable: | 2, 4 chips |
| Primary Cache: | 64 KB I + 64 KB D on-chip per core |
| Secondary Cache: | 512 KB I+D on-chip per core |
| L3 Cache: | 2 MB I+D on-chip per chip |
| Other Cache: | None |
| Memory: | 32 GB (16 x 2GB, DDR2-667, CL5, Reg, Dual Rank) |
| Disk Subsystem: | 2 x 73 GB 10000 RPM SAS (RAID 0) |
| Other Hardware: | None |

### Software

| Operating System: | SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp |
| Compiler: | PGI Server Complete Version 7.2, PathScale Compiler Suite Version 3.1 |
| Auto Parallel: | No |
| File System: | ReiserFS |
| System State: | Run Level 3 (multi-user) |
| Base Pointers: | 32/64-bit |
| Peak Pointers: | 32/64-bit |
| Other Software: | SmartHeap 8.0 32-bit Library for Linux |

### Errors

Run of 429.mcf (base) was not valid; status is RE
SPEC CINT2006 Result

Dell Inc.
PowerEdge R905 (AMD Opteron 8354, 2.20 GHz)

SPECint_rate2006 = NC
SPECint_rate_base2006 = NC

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated. The bug is fixed in CPU2006 V1.1.

Results Table

Benchmark | Copies | Seconds | Ratio | Segs | Seconds | Ratio | Segs | Seconds | Ratio | Segs | Seconds | Ratio | Segs | Seconds | Ratio
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
400.perlbench | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
401.bzip2 | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
403.gcc | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
429.mcf | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
445.gobmk | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
456.hmmer | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
458.sjeng | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
462.libquantum | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
464.h264ref | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
471.omnetpp | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
473.astar | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC
483.xalancbmk | 16 | NC | NC | NC | NC | NC | NC | 16 | NC | NC | NC | NC | NC | NC

Operating System Notes

'numactl' was used to bind copies to the cores
Environment variable PGI_HUGE_PAGES set to 150
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 4915200' was used to set environment locked pages in memory quantity
Set vm/nr_hugepages=2400 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages

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

Non-Compliant
SPEC CINT2006 Result

Dell Inc.
PowerEdge R905 (AMD Opteron 8354, 2.20 GHz)

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>NC</td>
</tr>
</tbody>
</table>

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Mar-2008
Hardware Availability: Apr-2008
Software Availability: May-2008

SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.

<table>
<thead>
<tr>
<th>Base Compiler Invocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C benchmarks: pgcc</td>
</tr>
<tr>
<td>C++ benchmarks: pgcpp</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base Portability Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64</td>
</tr>
<tr>
<td>401.bzip2: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>403.gcc: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>429.mcf: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>456.hmmer: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>458.sjeng: -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX -DSPEC_CPU_LP64</td>
</tr>
<tr>
<td>483.xalancbmk: -DSPEC_CPU_LINUX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base Optimization Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>C benchmarks:</td>
</tr>
<tr>
<td>-fast -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mfprelaxed</td>
</tr>
<tr>
<td>-Msmartalloc=large:150 -tp barcelona-64 -Bstatic_pgi</td>
</tr>
</tbody>
</table>
SPEC CINT2006 Result

Dell Inc.

PowerEdge R905 (AMD Opteron 8354, 2.20 GHz)

SPECint_rate2006 = NC
SPECint_rate_base2006 = NC

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Mar-2008
Hardware Availability: Apr-2008
Software Availability: May-2008

SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.

Base Optimization Flags (Continued)

C++ benchmarks:
- fastsse
- Mipa=jobs:4
- Mipa=fast
- Mipa:inline
- Mfprelaxed
- Msmartalloc=large:150
--zc_eh
- tp_barcelona
- Bstatic_pgi

C benchmarks:
- w

C++ benchmarks:
- w

Peak Compiler Invocation

pgcc
400.perlbench: pathcc
400.gcc: pathcc
445.gobmk: pathcc
C++ benchmarks (except as noted below):
pathCC

Continued on next page
SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.
SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.

Peak Optimization Flags (Continued)

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
          -fb_opt fbdata(pass 2) -m32 -O3 -OPT:Ofast

429.mcf: -fastsse -Mipa=jobs:4 -Mipa=fast -Mipa=inline:1
         -Msmartalloc=huge:150 -tp barcelona -Bstatic_pgi

445.gobmk: -march=barcelona -fb_create fbdata(pass 1)
             -fb_opt fbdata(pass 2) -m32 -OPT:alias=restrict -LNO:opt=0
             -CG:raise_on

456.hmmer: -fastsse -Munroll=n:8 -Msmartalloc=huge:150 -Mfprelaxed
        -Mipa=jobs:4 -Mipa=fast -Mipa=inline -tp barcelona-64
        -Bstatic_pgi

462.libquantum: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Munroll=m:8
                -Mipa=jobs:4 -Mipa=fast -Mipa=inline -Mipa=noarg
                -tp barcelona-64 -Bstatic_pgi

464.h264ref: -Mfpi=indirect(pass 1) -Mipa=jobs:4(pass 2)
              -Mipa=fast(pass 2) -Mipa=inline(pass 2)
              -Mfpo=indirect(pass 2) -fastsse -Msmartalloc=huge:150
              -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

Continued on next page
SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.

Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: -march=barcelona -Ofast -TENV:frame_pointer=off
-WOPT:if_conv=0 -GRA:optimize_boundary=on -IPA:plimit=525
-m32 -lsmartheap

483.xalancbmk: -march=barcelona -Ofast -m32 -OPT:unroll_times_max=8
-CG:push_pop_int_saved_regs=off -CG:ptr_load_use=0
-lsmartheap

Peak Other Flags

C benchmarks (except as noted below):
-w

400.perlbench: No flags used
403.gcc: No flags used
445.gobmk: No flags used

C++ benchmarks (except as noted below):
-L/root/work/cpu2006/amd123GH.libs/32

471.omnetpp: -w
SPEC has determined that this result was not compliant with the SPEC CPU2006 run and reporting rules. Specifically, not all of the benchmark workloads validated, as required in Rule 3.3 "Continuous Run Requirement". In SPEC's opinion, the violation was primarily due to a problem in the SPEC-supplied toolset. A bug in SPEC CPU2006 caused some failures not to be displayed on reports at the time that this result was generated.

The bug is fixed in CPU2006 V1.1.

The flags file that was used to format this result can be browsed at http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.html

You can download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.xml