## SPEC® CINT2006 Result

**Dell Inc.**

PowerEdge M605 (AMD Opteron 2376, 2.30 GHz)

<table>
<thead>
<tr>
<th>SPECint_rate2006</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006</td>
<td>100</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test date:** Dec-2008  
**Hardware Availability:** Nov-2008

**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Software Availability:** Oct-2008

### Hardware

<table>
<thead>
<tr>
<th>Type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>AMD Opteron 2376</td>
</tr>
<tr>
<td>CPU Characteristics</td>
<td></td>
</tr>
<tr>
<td>CPU MHz</td>
<td>2300</td>
</tr>
<tr>
<td>FPU</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled</td>
<td>8 cores, 2 chips, 4 cores/chip</td>
</tr>
<tr>
<td>CPU(s) orderable</td>
<td>1.2 chips</td>
</tr>
<tr>
<td>Primary Cache</td>
<td>64 KB I + 64 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache</td>
<td>512 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache</td>
<td>6 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>32 GB (8 x 4 GB DDR2-800)</td>
</tr>
<tr>
<td>Disk Subsystem</td>
<td>1 x 80 GB 5400 RPM SATA</td>
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<tr>
<td>Other Hardware</td>
<td>None</td>
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</table>

### Software

<table>
<thead>
<tr>
<th>Type</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server 10 (x86_64) SP2</td>
</tr>
<tr>
<td>Compiler</td>
<td>PGI Server Complete Version 7.2</td>
</tr>
<tr>
<td>Auto Parallel</td>
<td>No</td>
</tr>
<tr>
<td>File System</td>
<td>ReiserFS</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>32/64-bit</td>
</tr>
<tr>
<td>Other Software</td>
<td>binutils 2.18</td>
</tr>
<tr>
<td></td>
<td>32-bit and 64-bit libhugetlbfs libraries</td>
</tr>
<tr>
<td></td>
<td>SmartHeap 8.1 32-bit Library for Linux</td>
</tr>
</tbody>
</table>
Dell Inc.
PowerEdge M605 (AMD Opteron 2376, 2.30 GHz)

SPECint_rate2006 = 120
SPECint_rate_base2006 = 100

Results Table

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<tr>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>400.perlbench</td>
<td>8</td>
<td>754</td>
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<td>753</td>
<td>104</td>
<td>753</td>
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<td>429.mcf</td>
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<td>445.gobmk</td>
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<td>456.hmmer</td>
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<td>458.sjeng</td>
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<tr>
<td>462.libquantum</td>
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<tr>
<td>471.omnetpp</td>
<td>8</td>
<td>642</td>
<td>77.9</td>
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<td>78.0</td>
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<td>78.0</td>
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<tr>
<td>483.xalancbmk</td>
<td>8</td>
<td>555</td>
<td>99.4</td>
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<td>99.1</td>
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<td>99.3</td>
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<td>466</td>
<td>119</td>
<td>466</td>
<td>118</td>
<td>465</td>
<td>119</td>
<td></td>
<td></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/cpu2006_1.1/amd909gh-libs/64:/root/cpu2006_1.1/amd909gh-libs/32"
SPEC CINT2006 Result

Dell Inc.
PowerEdge M605 (AMD Opteron 2376, 2.30 GHz)

SPECint_rate2006 = 120
SPECint_rate_base2006 = 100

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

Test date: Dec-2008
Hardware Availability: Nov-2008
Software Availability: Oct-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

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# SPEC CINT2006 Result

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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

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<tr>
<th>Benchmark</th>
<th>Flags</th>
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<td><code>-DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>462.libquantum</td>
<td><code>-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX</code></td>
</tr>
<tr>
<td>464.h264ref</td>
<td><code>-DSPEC_CPU_LP64</code></td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td><code>-DSPEC_CPU_LINUX</code></td>
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### Peak Optimization Flags

C benchmarks:

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<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
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<tr>
<td>400.perlbench</td>
<td><code>-march=barcelona -fb_create fbdata(pass 1)</code></td>
</tr>
<tr>
<td></td>
<td><code>-fb_opt fbdata(pass 2)</code></td>
</tr>
<tr>
<td></td>
<td><code>-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT(pass 2)</code></td>
</tr>
<tr>
<td></td>
<td><code>-L/usr/lib64 -lhugetlbfs(pass 2) -Ofast -IPA:plimit=20000</code></td>
</tr>
<tr>
<td></td>
<td><code>-IPA:field_reorder=on -LNO:opt=0 -WOPT:if_conv=0</code></td>
</tr>
<tr>
<td></td>
<td><code>-CG:local_sched_alg=1</code></td>
</tr>
<tr>
<td>401.bzip2</td>
<td><code>-march=barcelona -O3 -OPT:alias=disjoint -OPT:Ofast</code></td>
</tr>
<tr>
<td></td>
<td><code>-OPT:goto=off -INLINE:aggressive=on -CG:local_sched_alg=1</code></td>
</tr>
<tr>
<td></td>
<td><code>-m3dnow</code></td>
</tr>
<tr>
<td></td>
<td><code>-Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT</code></td>
</tr>
<tr>
<td></td>
<td><code>-L/usr/lib64 -lhugetlbfs</code></td>
</tr>
<tr>
<td>403.gcc</td>
<td><code>-march=barcelona -fb_create fbdata(pass 1)</code></td>
</tr>
<tr>
<td></td>
<td><code>-fb_opt fbdata(pass 2) -Ofast -OPT:malloc_alg=1</code></td>
</tr>
<tr>
<td></td>
<td><code>-LNO:trip_count=256 -LNO:prefetch-ahead=10</code></td>
</tr>
<tr>
<td></td>
<td><code>-CG:prefer_lru_reg=off -m32</code></td>
</tr>
<tr>
<td>429.mcf</td>
<td><code>-march=barcelona -O3 -ipa -INLINE:aggressive=on</code></td>
</tr>
<tr>
<td></td>
<td><code>-CG:gc=off -GRA:prioritize_by_density=on -m32</code></td>
</tr>
<tr>
<td></td>
<td><code>-L/usr/lib -lhugetlbfs</code></td>
</tr>
</tbody>
</table>

Continued on next page
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### 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 -hugetlbfs(pass 2) -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 -Msmartalloc=huge -Msaefptr -Mprefetch=t0
  - -Mfprelaxed -Mipa=const -Mipa=ptr -Mipa=arg -Mipa=inline
  - -tp barcelona-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 -hugetlbfs(pass 2) -O3 -ipa
  - -LNO:ignore_feedback=off -LNO:full_unroll=10 -LNO:fusion=0
  - -LNO:fission=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
  - -Msmartalloc=huge -Mprefetch=distance:4 -Mfprelaxed
  - -Mipa=fast -Mipa=inline -Mipa=noarg -tp barcelona-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 -hugetlbfs(pass 2) -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 -Msmartalloc=huge -Msaefptr=global -Mfprelaxed
  - --zc_eh -tp barcelona-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:**
**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:

You can also download the XML flags sources by saving the following links: