Dell Inc.

PowerEdge SC1435 (AMD Opteron 2378, 2.40 GHz)

SPECint®2006 = 18.7
SPECint_base2006 = 15.5

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

Software
Operating System: SUSE Linux Enterprise Server 10 (x86_64) SP2, Kernel 2.6.16.60-0.21-smp
Compiler: PGI Server Complete Version 7.2, PathScale Compiler Suite Version 3.2
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: binutils 2.18, 32-bit and 64-bit libhugetlbfs libraries, SmartHeap 8.1 32-bit Library for Linux

Hardware
CPU Name: AMD Opteron 2378
CPU Characteristics:
CPU MHZ: 2400
FPU: Integrated
CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip
CPU(s) orderable: 1.2 chips
Primary Cache: 64 KB L1 + 64 KB D on chip per core
Secondary Cache: 512 KB L1+D on chip per core
L3 Cache: 6 MB L1+D on chip per chip
Other Cache: None
Memory: 32 GB (8 x 4 GB DDR2-800)
Disk Subsystem: 1 x 80 GB 7200 RPM SATA
Other Hardware: None
SPEC CINT2006 Result

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds Base</th>
<th>Ratio</th>
<th>Seconds Base</th>
<th>Ratio</th>
<th>Seconds Base</th>
<th>Ratio</th>
<th>Seconds Peak</th>
<th>Ratio</th>
<th>Seconds Peak</th>
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<tbody>
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<td>15.3</td>
<td>385</td>
<td>17.9</td>
<td>385</td>
<td>17.9</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=7146 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"
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SPECint_base2006 = 15.5

CPU2006 license: 55  
Test sponsor: Dell Inc.
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Base Compiler Invocation

C benchmarks: 
  \texttt{pgcc}

C++ benchmarks: 
  \texttt{pgcpp}

Base Portability Flags

- \texttt{400.perlbench}: \texttt{-DSPEC\_CPU\_LP64 }\texttt{-DSPEC\_CPU\_LINUX\_X64}
- \texttt{401.bzip2}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{403.gcc}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{429.mcf}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{445.gobmk}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{456.hmmer}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{458.sjeng}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{462.libquantum}: \texttt{-DSPEC\_CPU\_LP64 }\texttt{-DSPEC\_CPU\_LINUX}
- \texttt{464.h264ref}: \texttt{-DSPEC\_CPU\_LP64}
- \texttt{483.xalancbmk}: \texttt{-DSPEC\_CPU\_LINUX}

Base Optimization Flags

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

C++ benchmarks: 
  \texttt{-Mvect=cachesize:6291456 }\texttt{-fastsse }\texttt{-Msmartalloc=huge }\texttt{-Mfprelaxed}
  \texttt{--zc\_eh }\texttt{-Mipa=fast }\texttt{-Mipa:inline:10 }\texttt{-tp barcelona-32 }\texttt{-Bstatic_pgi}

Base Other Flags

C benchmarks: 
  \texttt{-Mipa=jobs:4}

C++ benchmarks: 
  \texttt{-Mipa=jobs:4}

Peak Compiler Invocation

C benchmarks (except as noted below):  
  \texttt{pathcc}

Continued on next page
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)
  -fb_opt fbdata(pass 2)
  -Wl,-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
  -m3dnow
  -Wl,-T/usr/share/libhugetlbfs/ldscripts/elf_x86_64.xBDT
  -L/usr/lib64 -lhugetlbfs

403.gcc: -march=barcelona -fb_create fbdata(pass 1)
  -fb_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:gc=off -GRA:prioritize_by_density=on -m32
  -L/usr/lib -lhugetlbfs

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## Dell Inc.

### PowerEdge SC1435 (AMD Opteron 2378, 2.40 GHz)

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<td>Software Availability: Oct-2008</td>
</tr>
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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 -lugetlbfs(pass 2) -O3 -OPT:alias=restrict
  
  -LNO:prefetch=1 -LNO:ignore_feedback=off -CG:p2align=on
  
- **456.hmmer**:
  
  -Mvect=cachesize:6291456 -fastsse -Mvect=partial
  
  -unroll=n:8 -Msmartalloc=huge -Msafeptr -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 -lugetlbfs(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 -lugetlbfs(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**:
  
  -Mpf(pass 1) -Mpsf(pass 2) -Mipa=fast(pass 2)
  
  -Mipa=inline:6(pass 2) -Mvect=cachesize:6291456 -fastsse
  
  -O4 -Msmartalloc=huge -Msafeptr=global -Mfprelaxed
  
  --zc_eh -tp barcelona-32 -Bstatic_pgi

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

### Peak Other Flags

**C benchmarks:**

- **471.omnetpp**: basepeak = yes

- **473.astar**:
  
  -Mpf(pass 1) -Mpsf(pass 2) -Mipa=fast(pass 2)
  
  -Mipa=inline:6(pass 2) -Mvect=cachesize:6291456 -fastsse
  
  -O4 -Msmartalloc=huge -Msafeptr=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

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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.20090713.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.20090713.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 other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.1.