Dell Inc.  

PowerEdge R815 (AMD Opteron 6278, 2.40 GHz)  

SPECint\textsubscript{rate\_2006} = 1030  
SPECint\_rate\_base\_2006 = 897

CPU\_2006 license: 55  
Test date: Feb-2012  
Test sponsor: Dell Inc.  
Hardware Availability: Jul-2012  
Tested by: Dell Inc.  
Software Availability: Jul-2011

<table>
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<td>473.astar</td>
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</tr>
<tr>
<td>483.xalancbmk</td>
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<td>949</td>
</tr>
</tbody>
</table>

Software

Operating System: SUSE Linux Enterprise Server 11 SP2 (x86_64) 3.0.13-0.27-default  
Compiler: C/C++: Version 4.5.1 of x86 Open64 Compiler Suite (from AMD)  
Auto Parallel: No  
File System: ext3  
System State: Run level 3 (Full multiuser with network)  
Base Pointers: 32/64-bit  
Peak Pointers: 32/64-bit  
Other Software: SmartHeap 10.0 32-bit Library for Linux

Hardware

CPU Name: AMD Opteron 6278  
CPU Characteristics: AMD Turbo CORE technology up to 3.30 GHz  
CPU MHz: 2400  
FPU: Integrated  
CPU(s) enabled: 64 cores, 4 chips, 16 cores/chip  
CPU(s) orderable: 2,4 chips  
Primary Cache: 512 KB I on chip per chip, 64 KB I shared / 2 cores; 16 KB D on chip per core  
Secondary Cache: 16 MB I+D on chip per chip, 2 MB shared / 2 cores  
L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 8 cores  
Other Cache: None  
Memory: 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
Disk Subsystem: 3 x 146 GB SAS, 15000 RPM  
Other Hardware: None  

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
**SPEC CINT2006 Result**

**Dell Inc.**

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---

**SPECint_rate2006** = 1030

**SPECint_rate_base2006** = 897

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**Results Table**

<table>
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<tr>
<th>Benchmark</th>
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<td><strong>949</strong></td>
<td>467</td>
<td>946</td>
</tr>
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**Submit Notes**

The config file option 'submit' was used. 'numactl' was used to bind copies to the cores. See the configuration file for details.

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**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

Set vm.nr_hugepages=57344 in /etc/sysctl.conf

mount -t hugetlbfs nodev /mnt/hugepages

---

**General Notes**

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

HUGETLB_LIMIT = "896"

LD_LIBRARY_PATH = "/root/cpu2006/amd1104-rate-libs-revC/32:/root/cpu2006/amd1104-rate-libs-revC/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 6274 chips + 64GB Memory using RHEL 6.1
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Base Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

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:
-march=bdver1 -Ofast -CG:local_sched_alg=1 -INLINE:aggressive=ON
-IPA:plimit=8000 -IPA:small_pu=100 -HP:bd=2m:heap=2m -msl
-LNO:prefetch=2

C++ benchmarks:
-march=bdver1 -Ofast -m32 -INLINE:aggressive=on -CG:cmp_peep=on
-D__OPEN64_FAST_SET -L/root/work/libraries/SmartHeap-10/lib -lsmartheap

Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64

Continued on next page
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Peak Portability Flags (Continued)

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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=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2) -Ofast -LNO:prefetch=2 -LNO:opt=0
- -IPA:plimit=20000 -OPT:unroll_times_max=8
- -OPT:unroll_size=256 -OPT:unroll_level=2 -OPT:keep_ext=on
- -WOPT:if_conv=0 -WOPT:sib=on -CG:local_sched_alg=1
- -CG:unroll_fb_reg=on -CG:movext_icmp=off -HP:bd=2m:heap=2m

401.bzip2:
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2) -O3 -LNO:prefetch=2 -LNO:pf2=0
- -OPT:alias=disjoint -OPT:goto=off -CG:local_sched_alg=1
- -HP:bd=2m:heap=2m

403.gcc:
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2) -Ofast -LNO:trip_count=256
- -CG:cmp_peep=on -CG:pre_minreg_level=2 -m32
- -HP:bd=2m:heap=2m -GRA:unspill=on -IPA:small_pu=200
- -WOPT:sib=on

429.mcf:
- -march=bdver1
- -O3
- -OPT:unroll_times_max=5 -ipa
- -INLINE:aggressive=on -CG:gcm=off -CG:dsched=on
- -GRA:prioritize_by_density=on -m32 -HP:bd=2m:heap=2m -msos

445.gobmk:
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2) -Ofast -OPT:unroll_size=256
- -OPT:unroll_times_max=8 -OPT:keep_ext=on -IPA:plimit=750
- -IPA:min_hotness=300 -IPA:pu_reorder=1
- -LNO:ignore_feedback=off -WOPT:if_conv=2 -HP:bd=2m:heap=2m

456.hmmer:
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2) -Ofast -LNO:prefetch=2
- -OPT:alias=disjoint -OPT:unroll_times_max=16
- -OPT:unroll_size=512 -OPT:unroll_level=2 -OPT:keep_ext=on
- -CG:cflow=0 -CG:cmp_peep=on -CG:pre_local_sched=off
- -HP:bd=2m:heap=2m

Continued on next page
## Peak Optimization Flags (Continued)

458.sjeng: 
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -Ofast
- -CG:ptr_load_use=0
- -CG:divrem_opt=on
- -CG:movext_icmp=off
- -CG:locs_best=on
- -LNO:full_unroll=10
- -IPA:pu_reorder=2
- -HP:heap=2m:bd=2m
- -WOPT:sib=on

462.libquantum: basepeak = yes

464.h264ref: 
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -O3
- -OPT:unroll_size=256
- -OPT:unroll_times_max=2
- -IPA:plimit=20000
- -CG:ptr_load_use=0
- -CG:local_sched_alg=1
- -HP:bdt=2m:heap=2m

C++ benchmarks:

471.omnetpp: basepeak = yes

473.astar: 
- -march=bdver1
- -fb_create fbdata(pass 1)
- -fb_opt fbdata(pass 2)
- -Ofast
- -TENV:frame_pointer=off
- -WOPT:if_conv=0
- -IP A:pu_reorder=2
- -CG:divrem_opt=on
- -CG:p2align=1
- -CG:dsched=on
- -GRA:optimize_boundary=on
- -OPT:alias=disjoint
- -INLINE:aggressive=on
- -IPA:small_pu=3000
- -IPA:plimit=3000
- -m32
- -HP:bdt=2m:heap=2m

483.xalancbmk: basepeak = yes

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/x86-open64-451-flags-rate-revC.xml

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

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