SPEC® CINT2006 Result

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Dell Inc.

PowerEdge R815
(AMD Opteron 6276, 2.30 GHz)

SPECint®_rate2006 =   488

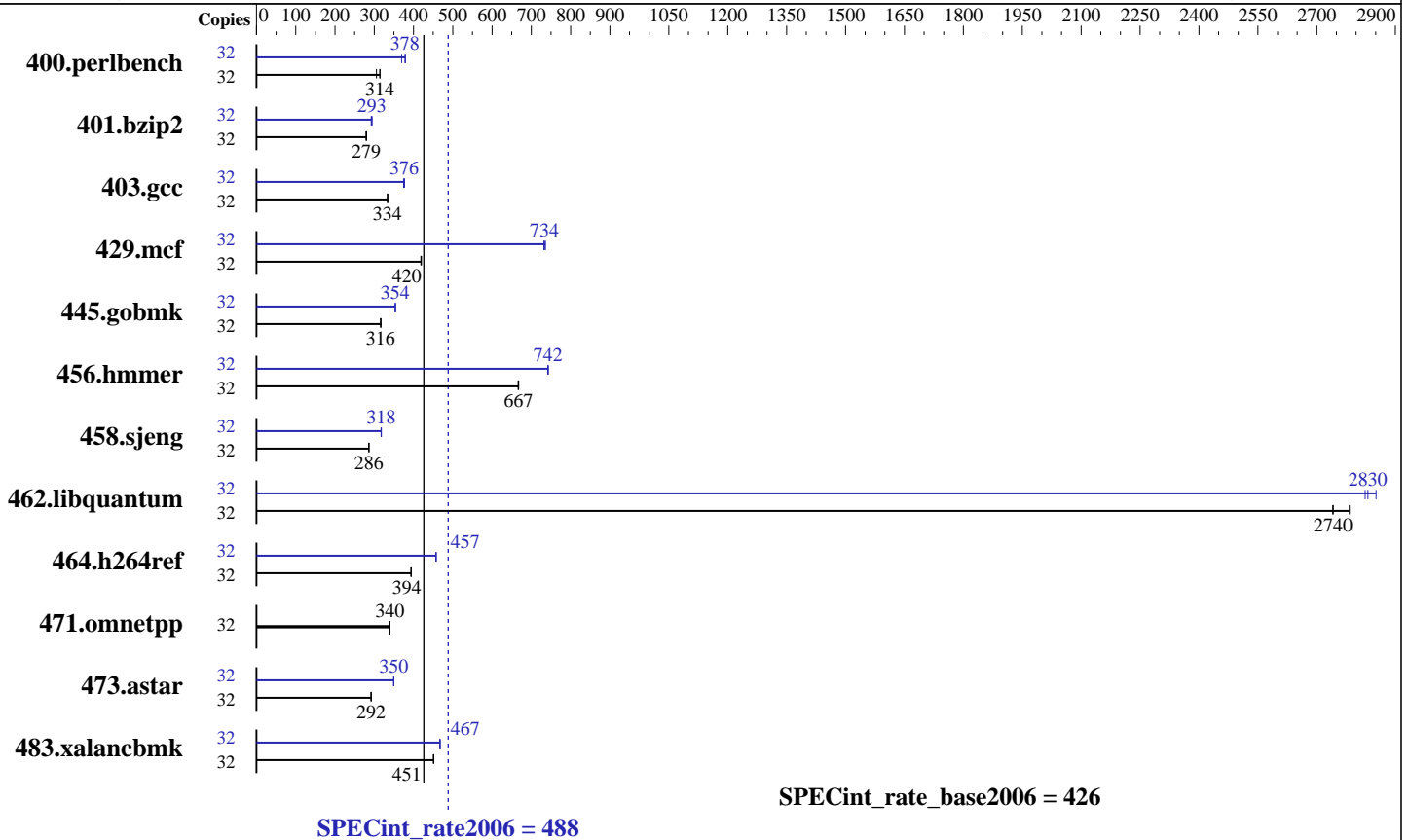SPECint_rate_base2006 = 426

CPU2006 license: 55

Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Nov-2011

Hardware Availability: Nov-2011

Software Availability: Jul-2011

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Hardware

CPU Name:	AMD Opteron 6276
CPU Characteristics:	AMD Turbo CORE technology up to 3.20 GHz
CPU MHz:	2300
FPU:	Integrated
CPU(s) enabled:	32 cores, 2 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:	2 x 160 GB SAS, 15000 RPM
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.1, Kernel 2.6.32-131.0.15.el6.x86_64
Compiler:	C/C++: Version 4.2.5.2 of x86 Open64 Compiler Suite (from AMD)
Auto Parallel:	No
File System:	ext4
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

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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	32	1023	306	**995**	**314**	994	315	32	**827**	**378**	846	370	824	379
401.bzip2	32	1101	280	**1106**	**279**	1106	279	32	1057	292	**1053**	**293**	1048	295
403.gcc	32	**772**	**334**	767	336	772	333	32	683	377	**684**	**376**	688	375
429.mcf	32	695	420	697	419	**696**	**420**	32	397	736	399	732	**398**	**734**
445.gobmk	32	1059	317	1062	316	**1061**	**316**	32	950	354	**949**	**354**	949	354
456.hmmer	32	448	666	447	668	**447**	**667**	32	402	742	**402**	**742**	402	743
458.sjeng	32	1352	286	1353	286	**1353**	**286**	32	**1219**	**318**	1220	317	1217	318
462.libquantum	32	238	2780	242	2740	**242**	**2740**	32	233	2850	235	2820	**234**	**2830**
464.h264ref	32	1799	394	1797	394	**1797**	**394**	32	1548	458	1550	457	**1549**	**457**
471.omnetpp	32	589	340	589	340	**589**	**340**	32	589	340	589	340	**589**	**340**
473.astar	32	769	292	769	292	**769**	**292**	32	**643**	**350**	643	350	643	349
483.xalancbmk	32	490	451	489	451	**490**	**451**	32	472	468	473	467	**472**	**467**

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.
    See the configuration file for details.

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

    Binaries were compiled on a system with 2x AMD Opteron 6276 chips + 128GB Memory using RHEL 6.1
    Huge pages, transparent Huge pages, and space randomization is controlled with the following settings:
    echo 57344 > /proc/sys/vm/nr_hugepages
    mount -t hugetlbfs nodev /mnt/hugepages
    echo never > /sys/kernel/mm/redhat_transparent_hugepage/enabled
    echo 0 > /proc/sys/kernel/randomize_va_space=0

Platform Notes

    'Power Management' set to 'Maximum Performance' in BIOS

General Notes

    Environment variables set by runspec before the start of the run:
    HUGETLB_LIMIT = "896"
    LD_LIBRARY_PATH = "/root/cpu2006-1.1/amd1104-rate-libs-revA/32:/root/cpu2006-1.1/amd1104-rate-libs-revA/64"
    The x86 Open64 Compiler Suite is only available from (and supported by) AMD at

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General Notes (Continued)

        http://developer.amd.com/cpu/open64

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 -mso
        -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

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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=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_req=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:bdt=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:bdt=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
               -GRA:prioritize_by_density=on -m32 -HP:bdt=2m:heap=2m -mso

   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:bdt=2m:heap=2m
```

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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:bd=2m:heap=2m
-WOPT:sib=on

462.libquantum: -march=bdver1 -Ofast -mso -OPT:unroll_size=512
-OPT:unroll_times_max=16 -LNO:prefetch=2
-LNO:prefetch_ahead=4 -LNO:pf2=0 -CG:local_sched_alg=1
-INLINE:aggressive=on -IPA:plimit=15000 -IPA:small_pu=100
-HP:bdt=2m:heap=2m,limit=300

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
-OPT:alias=disjoint -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 -WOPT:sib=on -CG:divrem_opt=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: -march=bdver1 -Ofast -LNO:prefetch=2 -OPT:unroll_size=512
-OPT:unroll_times_max=8 -D__OPEN64_FAST_SET
-INLINE:aggressive=on -m32 -CG:cmp_peep=on
-CG:local_sched=off -GRA:unspill=on -TENV:frame_pointer=off
-fno-emit-exceptions
-L/root/work/libraries/SmartHeap-10/lib -lsmartheap

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/amd1104-platform-rate-revA.20111122.html
http://www.spec.org/cpu2006/flags/x86-open64-425-flags-rate-revA.html

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You can also download the XML flags sources by saving the following links:
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http://www.spec.org/cpu2006/flags/x86-open64-425-flags-rate-revA.xml

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