



SPEC® CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Dell Inc.

SPECint®_rate2006 = 520

PowerEdge R715 (AMD Opteron 6278, 2.40 GHz)

SPECint_rate_base2006 = 454

CPU2006 license: 55

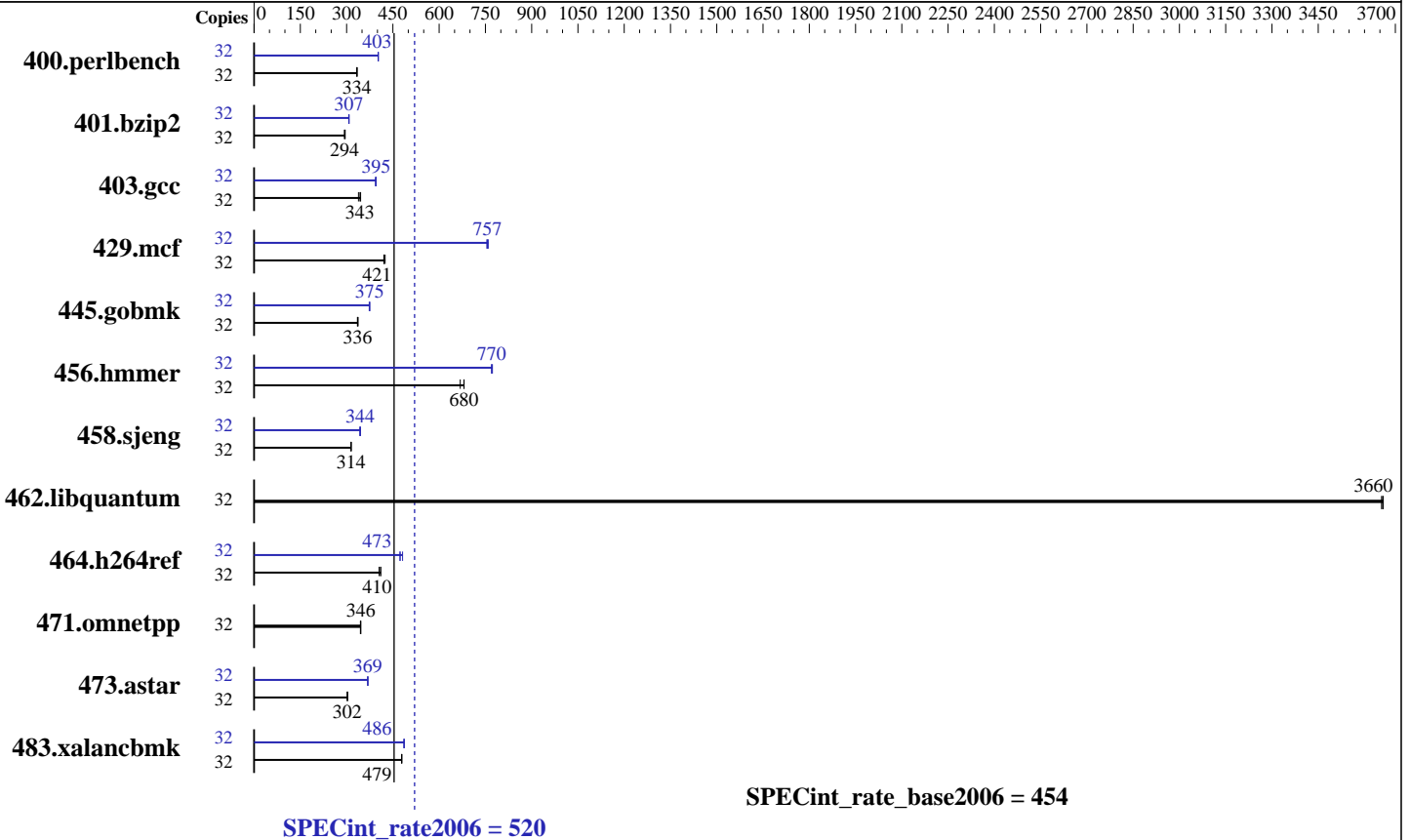
Test date: Jun-2012

Test sponsor: Dell Inc.

Hardware Availability: Jul-2012

Tested by: Dell Inc.

Software Availability: Jul-2011



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: 32 cores, 2 chips, 16 cores/chip
 CPU(s) orderable: 1,2 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

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



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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	936	334	<u>936</u>	<u>334</u>	940	332	32	<u>777</u>	<u>403</u>	776	403	777	402
401.bzip2	32	1045	295	1054	293	<u>1051</u>	<u>294</u>	32	<u>1005</u>	<u>307</u>	1002	308	1006	307
403.gcc	32	<u>750</u>	<u>343</u>	761	338	746	345	32	651	395	<u>651</u>	<u>395</u>	655	393
429.mcf	32	687	425	694	421	<u>692</u>	<u>421</u>	32	384	759	387	755	<u>386</u>	<u>757</u>
445.gobmk	32	<u>1000</u>	<u>336</u>	995	337	1001	335	32	<u>896</u>	<u>375</u>	895	375	899	373
456.hammer	32	447	668	438	681	<u>439</u>	<u>680</u>	32	<u>388</u>	<u>770</u>	386	773	388	770
458.sjeng	32	1233	314	1229	315	<u>1231</u>	<u>314</u>	32	<u>1126</u>	<u>344</u>	1129	343	1122	345
462.libquantum	32	181	3660	<u>181</u>	<u>3660</u>	181	3660	32	181	3660	<u>181</u>	<u>3660</u>	181	3660
464.h264ref	32	1725	411	<u>1726</u>	<u>410</u>	1748	405	32	1471	481	1497	473	<u>1496</u>	<u>473</u>
471.omnetpp	32	578	346	<u>578</u>	<u>346</u>	580	345	32	578	346	<u>578</u>	<u>346</u>	580	345
473.astar	32	743	302	741	303	<u>743</u>	<u>302</u>	32	610	369	609	369	<u>609</u>	<u>369</u>
483.xalancbmk	32	<u>461</u>	<u>479</u>	461	479	462	478	32	454	487	<u>454</u>	<u>486</u>	454	486

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

Set transparent_hugepage=never as a boot parameter in /boot/grub/menu.lst

Set vm/nr_hugepages=28672 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 -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 -lsmarheap

Peak Compiler Invocation

C benchmarks:
opencc

C++ benchmarks:
openCC

Peak Portability Flags

```

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64

```

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Peak Portability Flags (Continued)

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: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 -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:bd=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: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
             -OPT:alias=disjoint -CG:ptr_load_use=0
             -CG:local_sched_alg=1 -HP:bd=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
           -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:bd=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 -CG:p2align=1 -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/amd-platform-speed-revA-I.html>

<http://www.spec.org/cpu2006/flags/x86-open64-451-flags-rate-revC.html>

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

<http://www.spec.org/cpu2006/flags/amd-platform-speed-revA-I.xml>

<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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