SPEC® CINT2006 Result

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Dell Inc.

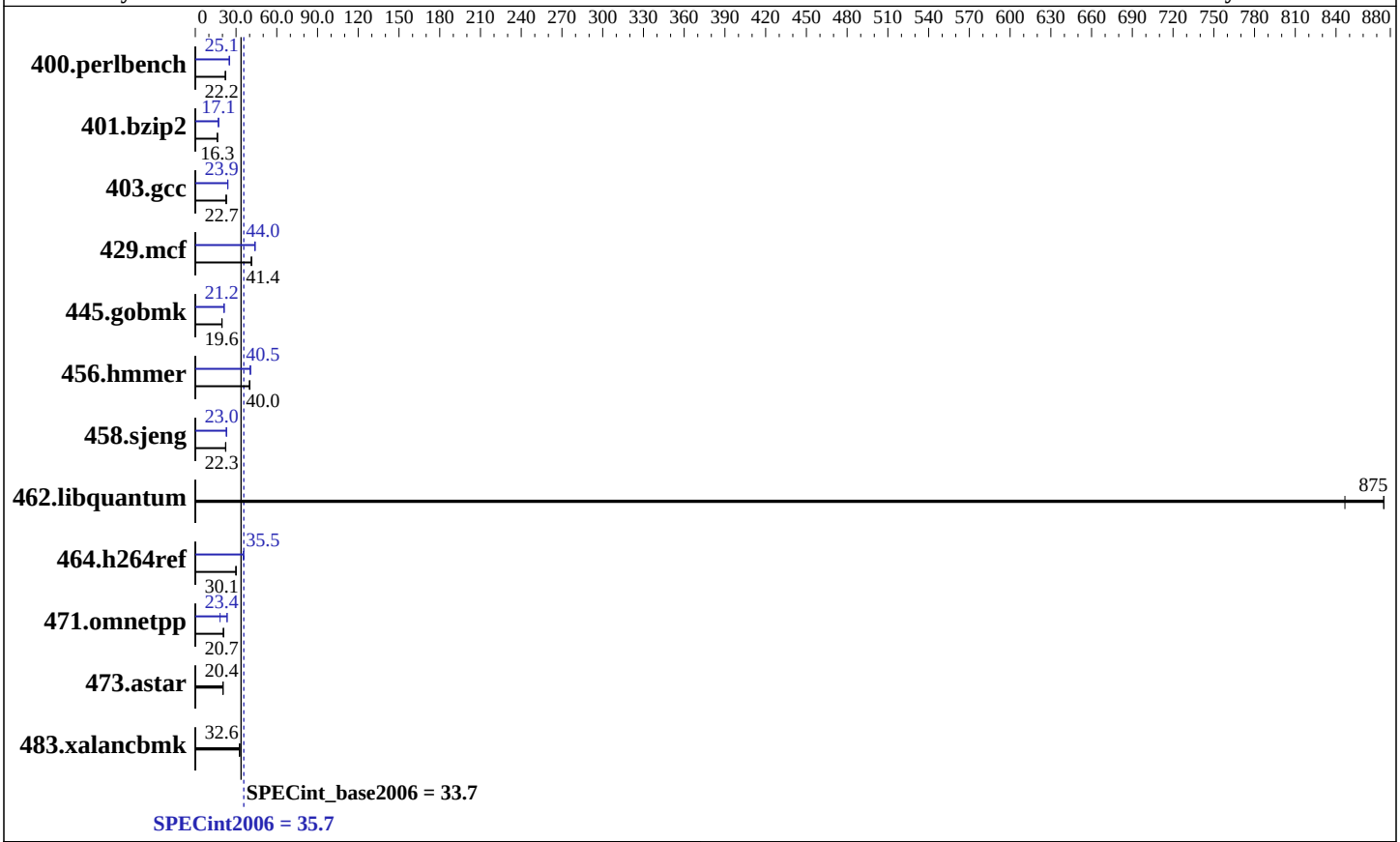
PowerEdge R710 (Intel Xeon E5645, 2.40 GHz)

SPECint®2006 = 35.7

SPECint_base2006 = 33.7

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

Test date: Feb-2011
Hardware Availability: Feb-2011
Software Availability: Jan-2011



Hardware

CPU Name:	Intel Xeon E5645
CPU Characteristics:	Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz:	2400
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 cores/chip
CPU(s) orderable:	1,2 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	12 MB I+D on chip per chip
Other Cache:	None
Memory:	48 GB (12 x 4 GB 2Rx4 PC3-10600R-9, ECC)
Disk Subsystem:	146 GB 10000 RPM SAS
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 SP1 (x86_64), Kernel 2.6.32.12-0.7-default
Compiler:	Intel C++ Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.1.116 Build 20101116
Auto Parallel:	Yes
File System:	ext3
System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V9.01

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	440	22.2	**440**	**22.2**	441	22.2	389	25.1	**389**	**25.1**	389	25.1
401.bzip2	593	16.3	592	16.3	**592**	**16.3**	**565**	**17.1**	565	17.1	565	17.1
403.gcc	**355**	**22.7**	355	22.7	351	22.9	336	23.9	337	23.9	**337**	**23.9**
429.mcf	**221**	**41.4**	220	41.4	221	41.3	208	43.8	207	44.1	**207**	**44.0**
445.gobmk	537	19.5	**536**	**19.6**	531	19.8	495	21.2	**495**	**21.2**	496	21.2
456.hmmer	**233**	**40.0**	233	40.0	233	40.0	**230**	**40.5**	230	40.6	230	40.5
458.sjeng	538	22.5	**542**	**22.3**	542	22.3	527	23.0	**527**	**23.0**	528	22.9
462.libquantum	**23.7**	**875**	23.7	875	24.5	847	**23.7**	**875**	23.7	875	24.5	847
464.h264ref	742	29.8	**736**	**30.1**	736	30.1	624	35.5	623	35.5	**623**	**35.5**
471.omnetpp	302	20.7	301	20.8	**301**	**20.7**	267	23.4	342	18.3	**267**	**23.4**
473.astar	343	20.5	345	20.3	**343**	**20.4**	343	20.5	345	20.3	**343**	**20.4**
483.xalancbmk	210	32.8	213	32.4	**212**	**32.6**	210	32.8	213	32.4	**212**	**32.6**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
'ulimit -s unlimited' was used to set the stacksize prior to run
'mount -t hugetlbfs nodev /mnt/hugepages' was used to enable large pages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
BIOS Settings:
Power Management = Maximum Performance (Default = Active Power Controller)
Data Reuse = Disabled (Default = Enabled)
Logical Processor = Disabled (Default = Enabled)
```

General Notes

```
OMP_NUM_THREADS set to number of cores
The Dell PowerEdge R710 and
the Bull NovaScale R460 F2 models are electronically equivalent.
The results have been measured on a Dell PowerEdge R710 model.
Binaries were compiled on RHEL5.5
```

Base Compiler Invocation

C benchmarks:

```
icc  -m64
```

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Base Compiler Invocation (Continued)

C++ benchmarks:
icpc -m64

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
471.omnetpp: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

C++ benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs
-L/smartheap -lsmartheap64
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

Base Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64

400.perlbench: icc -m32

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Peak Compiler Invocation (Continued)

429.mcf: `icc -m32`

445.gobmk: `icc -m32`

464.h264ref: `icc -m32`

C++ benchmarks (except as noted below):
`icpc -m64`

471.omnetpp: `icpc -m32`

Peak Portability Flags

400.perlbench: `-DSPEC_CPU_LINUX_IA32`
401.bzip2: `-DSPEC_CPU_LP64`
403.gcc: `-DSPEC_CPU_LP64`
456.hmmer: `-DSPEC_CPU_LP64`
458.sjeng: `-DSPEC_CPU_LP64`
462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
473.astar: `-DSPEC_CPU_LP64`
483.xalancbmk: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

400.perlbench: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2)
`-opt-prefetch -ansi-alias`
`-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT`

401.bzip2: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div -prof-use`(pass 2) `-auto-ilp32`
`-opt-prefetch -ansi-alias`

403.gcc: `-xSSE4.2 -ipo -O3 -no-prec-div -inline-calloc`
`-opt-malloc-options=3 -auto-ilp32`
`-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT`

429.mcf: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div`(pass 2) `-prof-use`(pass 2)
`-auto-ilp32 -ansi-alias`
`-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT`

445.gobmk: `-xSSE4.2`(pass 2) `-prof-gen`(pass 1) `-prof-use`(pass 2)
`-auto-ilp32 -ansi-alias`
`-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT`

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Peak Optimization Flags (Continued)

456.hmmer: -xSSE4.2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32
-ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-melf_x86_64 -Wl,-hugetlbfs-link=BDT

458.sjeng: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4

462.libquantum: basepeak = yes

464.h264ref: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll2 -ansi-alias
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

C++ benchmarks:

471.omnetpp: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-ra-region-strategy=block -ansi-alias -Wl,-z,muldefs
-L/smartheap -lsmartheap
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

Peak Other Flags

C benchmarks:

403.gcc: -Dalloca=_alloca

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.html
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110308.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.0-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Intel-Linux64-Platform.20110308.xml

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