SPEC® CINT2006 Result
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Fujitsu

$SPECint^®2006 =$ 45.0

CELSIUS M470, Intel Xeon W3690
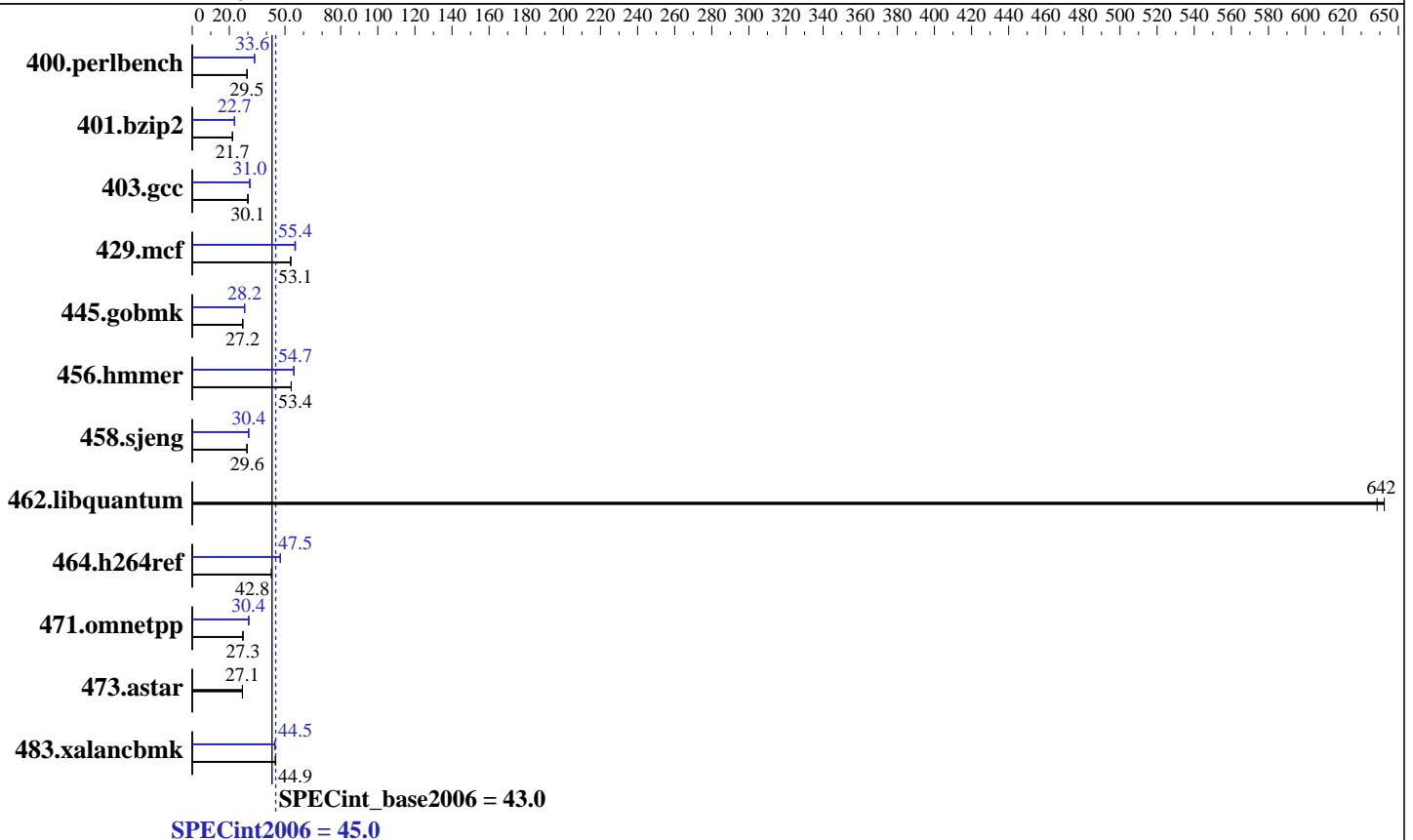
$SPECint\_base2006 =$ 43.0

CPU2006 license: 19
Test sponsor: Fujitsu
Tested by: Fujitsu

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

Benchmark results chart:

- 400.perlbench: 33.6 / 29.5
- 401.bzip2: 22.7 / 21.7
- 403.gcc: 31.0 / 30.1
- 429.mcf: 55.4 / 53.1
- 445.gobmk: 28.2 / 27.2
- 456.hmmer: 54.7 / 53.4
- 458.sjeng: 30.4 / 29.6
- 462.libquantum: 642
- 464.h264ref: 47.5 / 42.8
- 471.omnetpp: 30.4 / 27.3
- 473.astar: 27.1
- 483.xalancbmk: 44.5 / 44.9

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Hardware

CPU Name:	Intel Xeon W3690
CPU Characteristics:	Intel Turbo Boost Technology up to 3.73 GHz
CPU MHz:	3467
FPU:	Integrated
CPU(s) enabled:	6 cores, 1 chip, 6 cores/chip
CPU(s) orderable:	1 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:	12 GB (3 x 4 GB 2Rx8 PC3-10600E-9, ECC)
Disk Subsystem:	1 x SATA II, 160 GB, 7200 rpm
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 (x86_64), kernel 2.6.32.12-0.6-default
Compiler:	Intel C++ Intel 64 Compiler XE for applications running on Intel 64 Version 12.0.2.137 Build 20110112
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	330	29.6	331	29.5	**331**	**29.5**	**291**	**33.6**	291	33.5	291	33.6
401.bzip2	445	21.7	445	21.7	**445**	**21.7**	424	22.7	**424**	**22.7**	424	22.8
403.gcc	269	29.9	268	30.1	**268**	**30.1**	260	31.0	**260**	**31.0**	259	31.0
429.mcf	172	53.0	**172**	**53.1**	172	53.1	**165**	**55.4**	165	55.3	164	55.7
445.gobmk	385	27.2	**385**	**27.2**	385	27.2	371	28.3	**372**	**28.2**	372	28.2
456.hmmer	175	53.4	**175**	**53.4**	175	53.3	170	54.8	**170**	**54.7**	170	54.7
458.sjeng	411	29.4	**409**	**29.6**	409	29.6	397	30.5	398	30.4	**398**	**30.4**
462.libquantum	**32.3**	**642**	32.3	642	32.4	639	**32.3**	**642**	32.3	642	32.4	639
464.h264ref	520	42.6	**517**	**42.8**	516	42.9	465	47.5	467	47.3	**466**	**47.5**
471.omnetpp	**229**	**27.3**	228	27.4	229	27.3	204	30.6	**206**	**30.4**	206	30.3
473.astar	259	27.1	260	27.0	**259**	**27.1**	259	27.1	260	27.0	**259**	**27.1**
483.xalancbmk	153	45.0	154	44.7	**154**	**44.9**	154	44.7	**155**	**44.5**	155	44.4

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 stack size to unlimited prior to run
Hugepages were enabled by:
mount -t hugetlbfs nodev /mnt/hugepages
echo 900 > /proc/sys/vm/nr_hugepages
export HUGETLB_MORECORE=yes
export LD_PRELOAD=/usr/lib64/libhugetlbfs.so
```

Platform Notes

```
BIOS settings:
Hyper-Threading Technology = Disabled
Date Reuse Optimization = Disabled
```

General Notes

```
OMP_NUM_THREADS set to number of cores
KMP_AFFINITY set to granularity=fine,scatter
```

Base Compiler Invocation

C benchmarks:
```
icc -m64
```

C++ benchmarks:
```
icpc -m64
```

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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/opt/smartheap/intel64 -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
```
```
       429.mcf: icc -m32
```
```
    445.gobmk: icc -m32
```
```
   464.h264ref: icc -m32
```

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Peak Compiler Invocation (Continued)

C++ benchmarks (except as noted below):
```
icpc -m32
```

473.astar: `icpc -m64`

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_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

       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
```

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Peak Optimization Flags (Continued)

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/opt/smartheap/ia32 -lsmartheap
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

473.astar: basepeak = yes

483.xalancbmk: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
-Wl,-z,muldefs -L/opt/smartheap/ia32 -lsmartheap
-B /usr/share/libhugetlbfs/ -Wl,-hugetlbfs-link=BDT

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/Platform.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/Platform.xml

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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