



# SPEC® CINT2006 Result

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## IBM Corporation

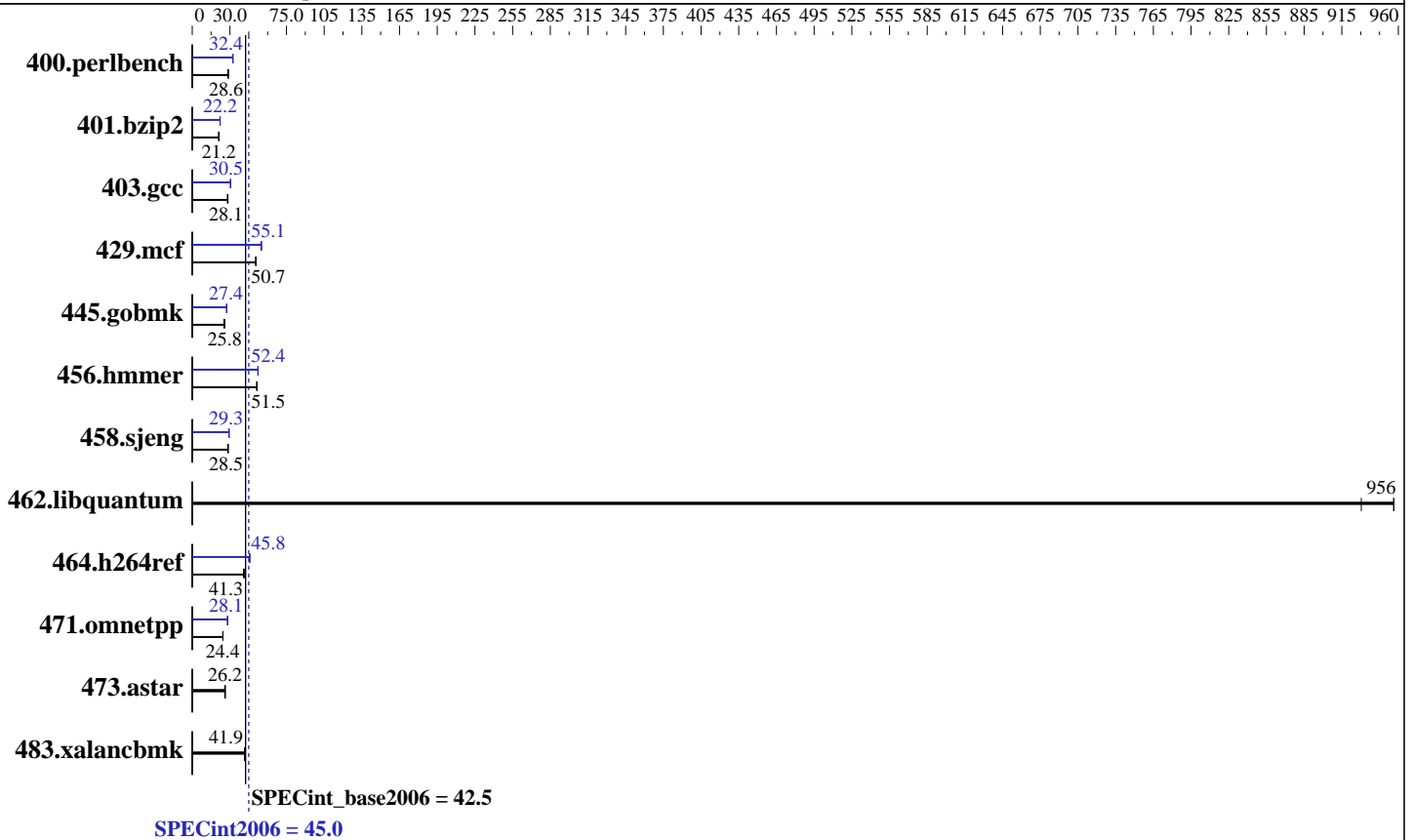
**SPECint®2006 = 45.0**

## IBM System x3650 M3 (Intel Xeon X5672)

**SPECint\_base2006 = 42.5**

**CPU2006 license:** 11  
**Test sponsor:** IBM Corporation  
**Tested by:** IBM Corporation

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



### Hardware

**CPU Name:** Intel Xeon X5672  
**CPU Characteristics:** Intel Turbo Boost Technology up to 3.60 GHz  
**CPU MHz:** 3200  
**FPU:** Integrated  
**CPU(s) enabled:** 8 cores, 2 chips, 4 cores/chip, 2 threads/core  
**CPU(s) orderable:** 1,2 chips  
**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:** 96 GB (12 x 8 GB 2Rx4 PC3-10600R-9, ECC)  
**Disk Subsystem:** 1 x 146 GB SAS, 15000 RPM  
**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	341	28.7	<b><u>341</u></b>	<b><u>28.6</u></b>	342	28.6	302	32.4	302	32.4	<b><u>302</u></b>	<b><u>32.4</u></b>
401.bzip2	<b><u>456</u></b>	<b><u>21.2</u></b>	457	21.1	456	21.2	<b><u>435</u></b>	<b><u>22.2</u></b>	435	22.2	435	22.2
403.gcc	286	28.1	<b><u>286</u></b>	<b><u>28.1</u></b>	283	28.4	264	30.5	264	30.5	<b><u>264</u></b>	<b><u>30.5</u></b>
429.mcf	181	50.5	<b><u>180</u></b>	<b><u>50.7</u></b>	180	50.7	165	55.1	<b><u>165</u></b>	<b><u>55.1</u></b>	167	54.7
445.gobmk	417	25.1	406	25.8	<b><u>406</u></b>	<b><u>25.8</u></b>	<b><u>383</u></b>	<b><u>27.4</u></b>	383	27.4	383	27.4
456.hammer	181	51.4	181	51.5	<b><u>181</u></b>	<b><u>51.5</u></b>	178	52.3	<b><u>178</u></b>	<b><u>52.4</u></b>	178	52.4
458.sjeng	425	28.4	<b><u>425</u></b>	<b><u>28.5</u></b>	422	28.7	413	29.3	<b><u>413</u></b>	<b><u>29.3</u></b>	413	29.3
462.libquantum	22.3	930	21.7	956	<b><u>21.7</u></b>	<b><u>956</u></b>	22.3	930	21.7	956	<b><u>21.7</u></b>	<b><u>956</u></b>
464.h264ref	<b><u>536</u></b>	<b><u>41.3</u></b>	536	41.3	542	40.8	484	45.8	483	45.8	<b><u>483</u></b>	<b><u>45.8</u></b>
471.omnetpp	256	24.4	<b><u>256</u></b>	<b><u>24.4</u></b>	256	24.4	222	28.1	<b><u>222</u></b>	<b><u>28.1</u></b>	222	28.1
473.astar	267	26.3	<b><u>268</u></b>	<b><u>26.2</u></b>	271	25.9	267	26.3	<b><u>268</u></b>	<b><u>26.2</u></b>	271	25.9
483.xalancbmk	166	41.6	<b><u>165</u></b>	<b><u>41.9</u></b>	164	42.1	166	41.6	<b><u>165</u></b>	<b><u>41.9</u></b>	164	42.1

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 to unlimited 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

```
Turbo Mode enabled in BIOS
Turbo Boost set to Traditional in BIOS
Power C-State enabled in BIOS
Data Reuse disabled in BIOS
Demand Scrub disabled in BIOS
```

## General Notes

```
OMP_NUM_THREADS set to number of cores
Binaries 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.hmmr: -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.hammer: -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.hmmcr: -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/IBM-platform-linux64-revA.20110420.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/IBM-platform-linux64-revA.20110420.xml>



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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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